

## RESUME OF THE ECOLOGICAL ASPECTS OF THE VEGETATIVE TYPES ON LATOUR STATE FOREST

Some of the broad characteristics of the four prominent vegetative cover types as found on Latour and elsewhere in this state are described below.

### MIXED CONIFER STANDS

This complex is common to the timber lands of California. These stands may be seen in the Sierra Nevada, Cascade and Coast Ranges. As with all coniferous species, trees forming these stands are found on increasingly higher elevations at lower latitudes. In Northern California they occur at elevations from 2000 feet to about 5000 feet. Merriam identifies this as a Transition Life Zone, one between the Upper Sonoran of the Central Valley and the Canadian, as found near the upper reaches of these mountain ranges.

Cold wet winters with hot dry summers are common in these stands, especially in this State. Average minimum temperatures will reach -25 degrees F., while maximum temperatures will often exceed 100 degrees F. Annual precipitation may vary from 20 to 90 inches, much of it falling as snow during January and February.

Though a mixed stand may vary in species composition, depending on its geographical location, in the western states the usual combination of species in a mixed conifer stand is:

- ponderosa pine (*Pinus ponderosa*)
- sugar pine (*P. lambertiana*)
- Douglas-fir (*Pseudotsuga menziesii*)
- white fir (*Abies concolor*)
- incense cedar (*Libocedrus decurrens*)

Regeneration by natural seedfall is often a problem in this type of stand. Without disease, insect losses, fire or logging, all of which disturb stand composition, these stands often tend to slowly approach a climax type wherein either Douglas-fir or one of the true firs will predominate in the stand. As the pines are species of higher value we prefer that the stand composition runs in favor of the more valuable species. Still there are factors which prevent viable seed from being disseminated regularly and seedfall is the only means by which these conifers may naturally regenerate. Heavy seed crop years occur at irregular intervals. The dominant and codominant older trees produce the best seed. In addition, other agents may limit or prevent seed from developing or germinating. These are seed eating insects, rodents, birds, abnormal spring frosts, dense understory vegetation.

In the mixed conifer stand the problem of erosion may or may not exist following logging. Much depends upon the degree of slope, its exposure to run off, and the type of soil at hand. Granular soils are easily eroded and tend to cut deeply unless water flow and stream load are blocked. On the other hand fine grained soils are often subject to sheet and wind erosion unless forest openings (landings, etc.,) are kept to a minimum size and number. In most cases adequate erosion control is attained by:

1. Constructing earthen water bars every 100 to 300 feet along skid trails.
2. By not skidding or hauling logs down ravines or creeks.
3. By keeping creek crossings at a minimum.
4. By constructing roads with proper side slopes, metal culverts, and gentle gradients.

These practices, of course, apply as well in the pure even-aged stands as they do in that of mixed conifer.

## PURE EVEN-AGED STANDS

In this State, usually at about 5000 feet, the mixed conifer stand of the arid transition zone gradually gives way to a pure even-aged stand. We find stand composition narrows down usually to white fir, or a white and red fir complex, as is the case on Latour Forest. Occasionally in the broad elevational band from about 6000 feet to 8000 feet (which Merriam referred to as the Canadian Zone), the stand is composed almost entirely of red fir. Brushfield conditions, of varying size, are often intermixed here with these stands. Because of their slow growth these fir stands are often managed solely for Christmas trees.

Seasons are somewhat shortened at this elevation. Aside from the occasional summer thunder shower, most of the precipitation occurs as snow, varying from a rainfall equivalent of 40 to about 120 inches. Maximum summer temperatures may reach as high as 80 to 90 degrees F. during the clear, hot days. Night time temperatures, however, cool to around 40 to 50 degrees F. during the summer. Winter minimum temperature may descend to as low as 10 degrees F. locally with lower minimums to a -10 degrees F. found elsewhere in such stands.

Erosion on the higher steeper hillsides is often a serious problem when these stands are opened by clear cutting. Still when selection or shelterwood logging is applied to these stands the residual stand often suffers heavy damage from windthrow. For these and other reasons we often clear cut such stands in small blocks or strips. In many well managed stands this is followed by machine piling or burning of slash to prepare a good seed bed for future seedfall.

Some of the most common stands of this type in the western states are:

- Douglas-fir
- white fir
- white fir - red fir
- western white pine (*P. monticola*)
- lodgepole pine (*P. contorta*)
- white and red fir with an admixture of western white pine

Other tree species occasionally found in minor numbers in such stands are:

- mountain hemlock (*Tsuga mertensiana*)
- engelman spruce (*Picea englemanni*)
- western larch (*Larix occidentalis*)
- Port Orford cedar (*Chamaecyparis lawsoniana*)

While locally these species may not be of commercial importance, elsewhere in the western states they are.

Regeneration for the most part is by natural seedfall, however under a coppice type of silviculture, Christmas trees of white and red fir often regenerate from the adventitious buds on cut stumps. While bumper seed crops may occur at two to five year intervals, this usually is sufficient to adequately re-stock cutover areas.

## BRUSHFIELDS

While this vegetative type has little commercial value, its value from the stand point of watershed protection and browse for wild game cannot be overlooked, particularly in this State.

Most brushfields of this state contain some form of manzanita in addition to other hardy shrubs. On Latour brushfield species composition generally consist of:

Parry manzanita (*Arctostaphylos parryana* V. S. Sutorum)  
snowbrush (*Ceanothus velutinus*)  
bitter cherry (*Prunus emarginatus*)  
chinkapin (*Castanopsis sempervirens*)

The weather pattern for the brushfields of the Transition Zone would closely resemble that of the mixed conifer stand. With increasing elevation, winter winds and frost periods become pronounced and long lasting. These tough, woody shrubs replace the pure even-aged stands around the taller mountain peaks and dominate the upper elevations until timber line is reached.

Limited soil moisture and nutrients often make the dense tangled brushfield a thing of permanence. On some sites, however, timber slowly encroaches from the edges inward, eventually choking out the brush.

#### MEADOWS AND PLANTATIONS

Flat mountain meadows often arise from old lake beds that have filled with silt. On gently sloping hillsides where spring flow is persistent over many years, the slow build up of soil and hydrophytic vegetation can eventually create a hanging meadow.

The soil of these meadows often "floats" on a layer of free water beneath it. Thus this dense, tangled mixture of grass roots and soil particles feels sponge-like when walked upon.

The meadow, as a headwaters to some streams, often provides that stream with a constant "culture" of aquatic insect life. An ample supply of good cool water and proper shade makes for an ideal trout habitat.

While meadows are natural moist openings in the forest cover, plantations are the man-made clearings which we have made in the brushfields at Latour. The windrowed brush of these areas is dried then burned. Finally to arrest brush regrowth, herbicides are sprayed on the area. Usually two or three chemical spray treatments are required to gain control of chinkapin infested areas. Once cleared the area is either planted or seed spotted to young pine or fir trees.

#### REFERENCES

The following Technical Papers published by the U. S. Forest Service.

1. Silvical Characteristics of Incense Cedar by G. H. Schubert, Tech. Paper #18, California Forest & Range Experimental Station.
2. Silvical Characteristics of White Fir by David C. Maul, Tech. Paper #25, California Forest & Range Experimental Station.
3. Silvical Characteristics of Douglas-Fir by L. Isaac and E. J. Dimock, II, Silvical Series #9, Pacific Northwest Forest & Range Experimental Station.
4. Silvical Characteristics of Sugar Pine by H. A. Powells and G. H. Schubert, Tech. Paper #14, California Forest & Range Experimental Station

Soil Vegetation Mosaic of Latour State Forest by E. N. Gladish, CDF, and J. I. Mallory, USFS, California Division of Forestry & Pacific Southwest Forest & Range Experimental Station.